Support for Work-for-Others Projects

Since its establishment in 1971 as an analytical chemistry laboratory intended to serve the scientific community at Argonne National Laboratory, the Analytical Chemistry Laboratory (ACL) has been called upon to provide analyses in support of a number of Argonne projects.

Fifteen years ago the ACL was asked to provide analytical expertise as a participating member of the DOE Superfund Environmental Survey Program. The ACL participation in such Work-for-Others (WFO) programs has since grown to include those for other DOE laboratories, the U.S. Environmental Protection Agency (EPA), the U.S. Army Corps of Engineers (USACE), and the National Institute of Standards and Technology. The ACL has also participated in projects for non-government agencies, such as the 3M Company.

The WFO experience with these organizations has been synergistic in that the uniqueness of some of these projects has helped the ACL become a more diversified, experienced, and proficient analytical laboratory. In meeting client needs, the ACL has developed some unique analytical capabilities and laboratory facilities.

Two of the more ambitious efforts in recent years are separate programs involving remediation of waste sites under the auspices of different federal agencies: (1) the EPA Region 5 Office Special Analytical Services (SAS) and (2) the USACE Formerly Utilized Site Remedial Action Program (FUSRAP). Both agencies require a certified/validated organization to serve as a quality assurance laboratory following standardized and defensible methodology; conveniently located and readily accessible; and having facilities and experienced personnel capable of processing hazardous and radioactive mixed waste of potentially unusual matrices.

The SAS program focuses on the EPA need for a provider of on-call analytical services, with quick turnaround to allow for real-time results contributing to problem solving and site remediation. This work primarily involves the analysis of mixed waste samples submitted to the ACL as part of EPA remediation programs initiated at three sites: Ottawa, Illinois; Belding and Benton Harbor, Michigan; and Chicago, Illinois.

Ottawa was the site of a company that applied luminescent paint containing ^{226}Ra to clock dials. The soil and groundwater samples analyzed by the ACL had been taken from the area of what was the building foundation and surrounding grounds, as well as local hot spots in area landfills where material from the site had been dumped. The samples were analyzed for $^{226/228}$Ra by gamma spectroscopy and for isotopic U-Th by alpha spectroscopy.

Surplus metal from the Belding and Benton Harbor sites had been sold to an Arkansas foundry and later discovered to be radioactive. The material was tracked to a warehouse that had contained nearly 35,000 radium-painted airplane gauges, compasses, switches, etc., dating from World War II. The waste materials had been shredded, mixed, and packed in one-gallon paint cans, whose geometry posed an analytical challenge in instrument calibration and determination of ^{226}Ra content. The ACL provided accurate gamma spectroscopy results within 24 hours. The Lindsay Light site was used to manufacture thorium lantern mantles in the Chicago downtown area. As part of the EPA's remediation plan, the ACL analyzed soil samples by gamma spectroscopy and identified ^{226}Ra “hot spots.”

The USACE FUSRAP program is a more long-term approach to remediation, with ongoing periodic sampling of FUSRAP sites to determine their

environmental status. The ACL involvement covered two USACE districts: Buffalo and Baltimore.

The Buffalo district is responsible for several FUSRAP sites in New York (two in Ashland and one in Niagara Falls), along with a site in Luckey, Ohio. The ACL served the Buffalo district as a quality assurance laboratory for the analysis of ambient matrix samples (e.g., soil, sediment, ground, or surface water) from the remediation sites. These sites are the object of remediation efforts requiring analytical data for making decisions.

The ACL also analyzed samples received through the Baltimore district of the USACE from the site of a former electroplating facility and manufacturer of components from uranium and thorium (in Colonie, New York). Our data for this site helped the Baltimore district ensure the quality of the data previously received from production laboratories analyzing samples taken from the same contaminated site.

The ACL has been successful in meeting the needs of agencies like the EPA and FUSRAP and continues to provide these services as a part of its WFO programs.

ANL Participants

Frederic J. Martino, David W. Green, Tony TenKate, Francis Markun, Lesa L. Smith, Alice M. Essling, Lynn B. TenKate, Susan J. Lopykinski, and Michael J. Kalensky. For further information contact Amrit Boparai at (630) 252-7710 or bopari@cmt.anl.gov.